

## IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Previously Presented): A process for the preparation of polyisobutylene phenol-containing Mannich adducts, comprising:

a) alkylating a phenol with at least one polyisobutene having more than 70 mol % of vinylidene double bonds and a number average molecular weight of from 300 to 3000 at below about 50°C in the presence of an alkylation catalyst;

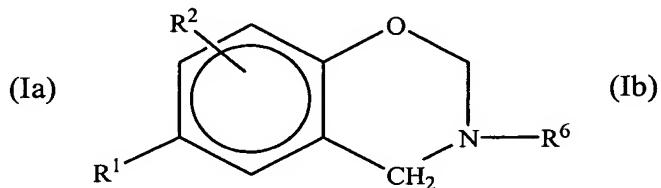
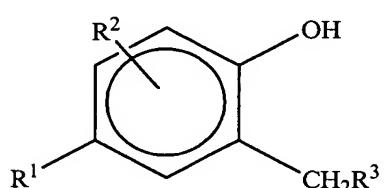
b) reacting the reaction product from a) with formaldehyde, an oligomer or a polymer of formaldehyde and

at least one amine which has at least one secondary amino function and no primary amino function.

Claim 2 (Canceled).

Claim 3 (Canceled).

**Claim 4 (Previously Presented):** The process as claimed in Claim 1, wherein an adduct mixture is obtained which comprises at least 40 mol% of compounds of one or more of formula Ia and Ib,

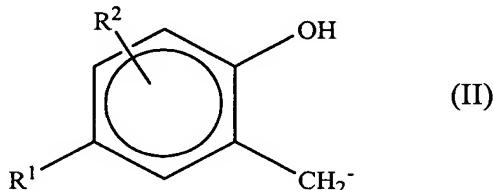


where

$R^1$  is a terminally bonded polyisobutylene radical,

$R^2$  is H, C<sub>1</sub>- to C<sub>20</sub>-alkyl, C<sub>1</sub>- to C<sub>20</sub>-alkoxy, hydroxyl, a polyalkylenyl radical or CH<sub>2</sub>NR<sup>4</sup>R<sup>5</sup>, where R<sup>4</sup> and R<sup>5</sup> have the meanings stated below, and

$R^3$  is NR<sup>4</sup>R<sup>5</sup>, where R<sup>4</sup> and R<sup>5</sup>, independently of one another, are H, C<sub>1</sub>- to C<sub>20</sub>-alkyl, C<sub>3</sub>- to C<sub>8</sub>-cycloalkyl and C<sub>1</sub>- to C<sub>20</sub>-alkoxy radicals which may be interrupted and/or substituted by N and O heteroatoms, and phenol radicals of the formula II



where R<sup>1</sup> and R<sup>2</sup> are as defined above;

with the proviso that R<sup>4</sup> and R<sup>5</sup> are not simultaneously H or phenol radicals of the formula II; or R<sup>4</sup> and R<sup>5</sup>, together with the N atom to which they are bonded, form a 5-, 6- or 7-membered cyclic structure which has one or two N and O heteroatoms and may be substituted by one, two or three C<sub>1</sub>- to C<sub>6</sub>-alkyl radicals; and

$R^6$  is a radical R<sup>4</sup> or R<sup>5</sup> other than H.

**Claim 5 (Previously Presented):** The process as claimed in Claim 1, wherein a Mannich adduct having a polydispersity of from 1.1 to 3.5 is obtained.

**Claim 6 (Canceled).**

**Claim 7 (Previously Presented):** The process as claimed in Claim 1, further comprising:

fractionating the reaction mixture from b) by column chromatography over an acidic stationary phase by multistage elution with

- at least one hydrocarbon and then
- at least one basic alcohol/water mixture.

**Claim 8 (Previously Presented):** The process as claimed in claim 7, wherein the basic alcohol/water mixture is a mixture of

- a) from 75 to 99.5% by weight of at least one C<sub>2</sub>- to C<sub>4</sub>-alcohol,
- b) from 0.4 to 24.4% by weight of water, and
- c) from 0.1 to 15% by weight of at least one amine which is volatile at room temperature.

**Claim 9 (Previously Presented):** The process as claimed in Claim 1, wherein an adduct mixture obtained includes from 0 to 20 mol% of polyisobutylphenols from reaction step a) which are not reacted further.

**Claim 10 (Previously Presented):** A Mannich adduct obtained by

- a) alkylation of a phenol with polyisobutene having more than 70 mol % of vinylidene double bonds and a number average molecular weight of from 300 to 3000 at below about 50°C in the presence of an alkylation catalyst;
- b) reaction of the reaction product from a) with formaldehyde, an oligomer or a polymer of formaldehyde and at least one amine which has at least one secondary amino function and no primary amino function.

**Claim 11 (Canceled).**

Claim 12 (Previously Presented): An additive concentrate, comprising:  
one or more to conventional additive components and at least one Mannich adduct as  
claimed in claim 10 in an amount of from 0.1 to 99.9% by weight.

Claim 13 (Original): A fuel composition containing a main amount of a liquid  
hydrocarbon fuel and an amount, having detergent activity, of at least one adduct as claimed  
in claim 10.

Claim 14 (Original): A lubricant composition containing a main amount of a liquid,  
semisolid or solid lubricant and an amount, having detergent activity, of at least one adduct as  
claimed in claim 10.

Claim 15 (Canceled).

Claim 16 (Previously Presented): A method of preparing a detergetized fuel or  
lubricant comprising mixing:  
the Mannich adduct of Claim 10 with a fuel or a lubricant.

Claim 17 (Previously Presented): A method of preparing a detergetized gasoline or  
diesel fuel comprising:

mixing the Mannich adduct of Claim 10 with a gasoline or a diesel fuel.

Claim 18 (Previously Presented): The process as claimed in Claim 1, wherein an  
adduct mixture obtained includes from 1-15 mol% of polyisobutylene phenols from reaction  
step a) which are not reacted further.

**Claim 19 (Previously Presented):** An additive concentrate, comprising: one or more conventional additive components and at least one Mannich adduct as claimed in Claim 10 in an amount of from 0.5-80% by weight.

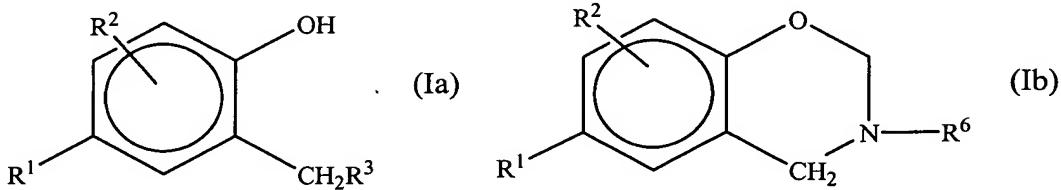
**Claim 20 (Previously Presented):** A process for the preparation of polyisobutenyphenol-containing Mannich adducts, comprising:

- a) alkylating a phenol with at least one polyisobutene having more than 70 mol % of vinylidene double bonds and a number average molecular weight of from 300 to 3000 at below about 50°C in the presence of an alkylation catalyst; and
- c) reacting the reaction product from a) with at least one adduct of at least one amine which has at least one secondary or primary amino function and formaldehyde, an oligomer of formaldehyde, a polymer of formaldehyde or a formaldehyde equivalent.

**Claim 21 (Previously Presented)** The process as claimed in claim 20, wherein the amine is at least one selected from the group consisting of 3-(dimethylamino)-n-propylamine, di[3-(dimethylamino)-n-propyl]amine, dimethylamine, diethylamine, di-n-propylamine and morpholine.

**Claim 22 (Previously Presented):** The process as claimed in claim 20, wherein the adduct is an aminal of formaldehyde with a secondary amine selected from the group consisting of di-C<sub>1</sub>-C<sub>8</sub>-alkylamines whose alkyl groups may be substituted by an N(C<sub>1</sub>-C<sub>4</sub>-alkyl)<sub>2</sub> group and cyclic amines which have 4 to 6 carbon atoms and whose cyclic structure may be interrupted by one or more of O and a N-C<sub>1</sub>-C<sub>4</sub>-alkyl group.

Claim 23 (Previously Presented): The process as claimed in Claim 20, wherein an adduct mixture is obtained which comprises at least 40 mol% of compounds of one or more of formula Ia and Ib,

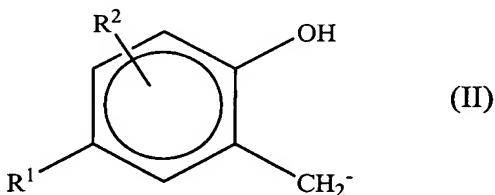


where

R<sup>1</sup> is a terminally bonded polyisobutetyl radical,

R<sup>2</sup> is H, C<sub>1</sub>- to C<sub>20</sub>-alkyl, C<sub>1</sub>- to C<sub>20</sub>-alkoxy, hydroxyl, a polyalkylenyl radical or CH<sub>2</sub>NR<sup>4</sup>R<sup>5</sup>, where R<sup>4</sup> and R<sup>5</sup> have the meanings stated below, and

R<sup>3</sup> is NR<sup>4</sup>R<sup>5</sup>, where R<sup>4</sup> and R<sup>5</sup>, independently of one another, are H, C<sub>1</sub>- to C<sub>20</sub>-alkyl, C<sub>3</sub>- to C<sub>8</sub>-cycloalkyl and C<sub>1</sub>- to C<sub>20</sub>-alkoxy radicals which may be interrupted and/or substituted by N and O heteroatoms, and phenol radicals of the formula II



where R<sup>1</sup> and R<sup>2</sup> are as defined above;

with the proviso that R<sup>4</sup> and R<sup>5</sup> are not simultaneously H or phenol radicals of the formula II; or R<sup>4</sup> and R<sup>5</sup>, together with the N atom to which they are bonded, form a 5-, 6- or 7-membered cyclic structure which has one or two N and O heteroatoms and may be substituted by one, two or three C<sub>1</sub>- to C<sub>6</sub>-alkyl radicals; and

R<sup>6</sup> is a radical R<sup>4</sup> or R<sup>5</sup> other than H.

Claim 24 (Previously Presented): The process as claimed in Claim 20, wherein a Mannich adduct having a polydispersity of from 1.1 to 3.5 is obtained.

Claim 25 (Previously Presented): The process as claimed in Claim 20, wherein the reaction product from a) is reacted with at least one adduct of an amine and at least one selected from the group consisting of formaldehyde, an oligomer of formaldehyde, a polymer of formaldehyde and a formaldehyde equivalent by reacting the two reactants for at least 15 minutes at above +15°C.

Claim 26 (Previously Presented): The process as claimed in Claim 20, further comprising:

fractionating the reaction mixture from c) by column chromatography over an acidic stationary phase by multistage elution with

- at least one hydrocarbon and then
- at least one basic alcohol/water mixture.

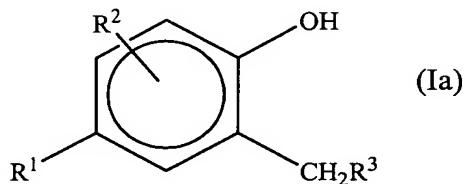
Claim 27 (Previously Presented): The process as claimed in claim 26, wherein the basic alcohol/water mixture is a mixture of

- a) from 75 to 99.5% by weight of at least one C<sub>2</sub>- to C<sub>4</sub>-alcohol,
- b) from 0.4 to 24.4% by weight of water, and
- c) from 0.1 to 15% by weight of at least one amine which is volatile at room temperature.

Claim 28 (Previously Presented): The process as claimed in Claim 20, wherein an adduct mixture obtained includes from 0 to 20 mol% of polyisobutetylphenols from reaction step a) which are not reacted further.

Claim 29 (Previously Presented): The process as claimed in Claim 20, wherein an adduct mixture obtained includes from 1-15 mol% of polyisobutetylphenols from a) which are not reacted further.

Claim 30 (Previously Presented): The process as claimed in Claim 1, wherein an adduct mixture is obtained which comprises at least 40 mol% of a compound of formula Ia

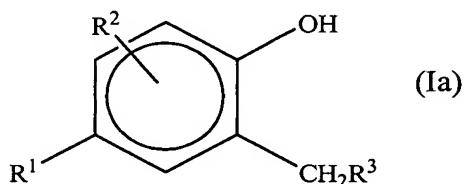


where R<sup>1</sup> is a terminally bonded polyisobutetyl radical,

R<sup>2</sup> is H, C<sub>1</sub>- to C<sub>20</sub>-alkyl, C<sub>1</sub>- to C<sub>20</sub>-alkoxy, hydroxyl, a polyalkylenyl radical or CH<sub>2</sub>NR<sup>4</sup>R<sup>5</sup>, where R<sup>4</sup> and R<sup>5</sup> have the meanings stated below, and

R<sup>3</sup> is N(CH<sub>3</sub>)<sub>2</sub>.

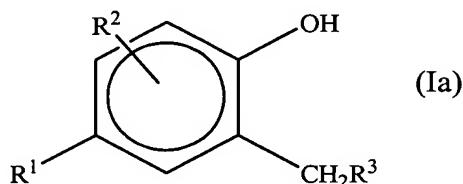
Claim 31 (Previously Presented): The process as claimed in Claim 1, wherein an adduct mixture is obtained which comprises at least 40 mol% of a compound of formula Ia



where R<sup>1</sup> is a terminally bonded polyisobutetyl radical,

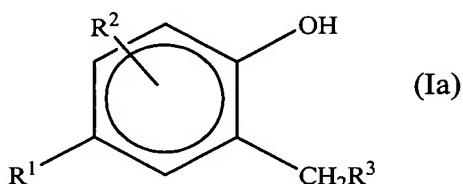
$R^2$  is H, C<sub>1</sub>- to C<sub>20</sub>-alkyl, C<sub>1</sub>- to C<sub>20</sub>-alkoxy, hydroxyl, a polyalkylenyl radical or CH<sub>2</sub>NR<sup>4</sup>R<sup>5</sup>, where R<sup>4</sup> and R<sup>5</sup> have the meanings stated below, and  
 $R^3$  is N(R<sup>4</sup>R<sup>5</sup>) are independently, butyl groups selected from the group consisting of N-butyl, isobutyl, sec-butyl, and tert-butyl.

Claim 32 (Previously Presented): The process as claimed in Claim 23, wherein an adduct mixture is obtained which comprises at least 40 mol% of a compound of formula Ia



where  $R^1$  is a terminally bonded polyisobut enyl radical,  
 $R^2$  is H, C<sub>1</sub>- to C<sub>20</sub>-alkyl, C<sub>1</sub>- to C<sub>20</sub>-alkoxy, hydroxyl, a polyalkylenyl radical or CH<sub>2</sub>NR<sup>4</sup>R<sup>5</sup>, where R<sup>4</sup> and R<sup>5</sup> have the meanings stated below, and  
 $R^3$  is N(CH<sub>3</sub>)<sub>2</sub>.

Claim 33 (Previously Presented): The process as claimed in Claim 23, wherein an adduct mixture is obtained which comprises at least 40 mol% of a compound of formula Ia



where  $R^1$  is a terminally bonded polyisobut enyl radical,  
 $R^2$  is H, C<sub>1</sub>- to C<sub>20</sub>-alkyl, C<sub>1</sub>- to C<sub>20</sub>-alkoxy, hydroxyl, a polyalkylenyl radical or CH<sub>2</sub>NR<sup>4</sup>R<sup>5</sup>, where R<sup>4</sup> and R<sup>5</sup> have the meanings stated below, and  
 $R^3$  is N(R<sup>4</sup>R<sup>5</sup>) are independently, butyl groups selected from the group consisting of N-butyl, isobutyl, sec-butyl, and tert-butyl.

Claim 34 (New): The process as claimed in Claim 1, wherein the polyisobutene has a number average molecular weight of from 500 to 1500.

Claim 35 (New): The process as claimed in Claim 1, wherein the phenol is at least one of an unsubstituted phenol and an alkyl substituted phenol.

Claim 36 (New): The process as claimed in Claim 1, wherein the phenol is 2-methyl phenol.

Claim 37 (New): The process as claimed in Claim 1, wherein the amine is a secondary amine of formula  $\text{HNR}^4\text{R}^5$ , wherein  $\text{R}^4$  and  $\text{R}^5$  are substituents other than hydrogen.

Claim 38 (New): The process as claimed in Claim 1, wherein the amine is a secondary amine of formula  $\text{HNR}^4\text{R}^5$ , wherein  $\text{R}^4$  and  $\text{R}^5$  are independently a  $\text{C}_1\text{-C}_{20}$  alkyl radical which may be at least one of interrupted and substituted by at least one of N and O, wherein N and O may be substituted.

Claim 39 (New): The process as claimed in Claim 38, wherein at least one of the  $\text{C}_1\text{-C}_{20}$  alkyl radicals is at least one of interrupted and substituted by at least one of N and O which is substituted with at least one selected from the group consisting of H,  $\text{C}_1\text{-C}_6$ -alkyl, an aryl group and a hetaryl group.

Claim 40 (New): The process as claimed in Claim 1, wherein the amine is at least one selected from the group consisting of dimethylamine, diethylamine, methylethylamine,

di-n-propylamine, diisopropylamine, diisobutylamine, di-sec-butylamine, di-tert-butylamine, dipentylamine, dihexylamine, dicyclopentylamine, dicyclohexylamine, and diphenylamine.

Claim 41 (New): The Mannich adduct as claimed in Claim 10, wherein the polyisobutene has a number average molecular weight of from 500 to 1500.

Claim 42 (New): The Mannich adduct as claimed in Claim 10, wherein the phenol is at least one of an unsubstituted phenol and an alkyl substituted phenol.

Claim 43 (New): The Mannich adduct as claimed in Claim 10, wherein the phenol is 2-methyl phenol.

Claim 44 (New): The Mannich adduct as claimed in Claim 10, wherein the amine is a secondary amine of formula  $\text{HNR}^4\text{R}^5$ , wherein  $\text{R}^4$  and  $\text{R}^5$  are substituents other than hydrogen.

Claim 45 (New): The Mannich adduct as claimed in Claim 10, wherein the amine is a secondary amine of formula  $\text{HNR}^4\text{R}^5$ , wherein  $\text{R}^4$  and  $\text{R}^5$  are independently a  $\text{C}_1\text{-C}_{20}$  alkyl radical which may be at least one of interrupted and substituted by at least one of N and O, wherein N and O may be substituted.

Claim 46 (New): The Mannich adduct as claimed in Claim 45, wherein at least one of the  $\text{C}_1\text{-C}_{20}$  alkyl radicals is at least one of interrupted and substituted by at least one of N and O which is substituted with at least one selected from the group consisting of H,  $\text{C}_1\text{-C}_6$ -alkyl, an aryl group and a hetaryl group.

**Claim 47 (New):** The Mannich adduct as claimed in Claim 10, wherein the amine is at least one selected from the group consisting of dimethylamine, diethylamine, methylethylamine, di-n-propylamine, diisopropylamine, diisobutylamine, di-sec-butylamine, di-tert-butylamine, dipentylamine, dihexylamine, dicyclopentylamine, dicyclohexylamine, and diphenylamine.

**Claim 48 (New):** The process as claimed in Claim 20, wherein the polyisobutene has a number average molecular weight of from 500 to 1500.

**Claim 49 (New):** The process as claimed in Claim 20, wherein the phenol is at least one of an unsubstituted phenol and an alkyl substituted phenol.

**Claim 50 (New):** The process as claimed in Claim 20, wherein the phenol is 2-methyl phenol.

**Claim 51 (New):** The process as claimed in Claim 20, wherein the amine is a secondary amine of formula  $\text{HNR}^4\text{R}^5$ , wherein  $\text{R}^4$  and  $\text{R}^5$  are substituents other than hydrogen.

**Claim 52 (New):** The process as claimed in Claim 51, wherein the amine is a secondary amine of formula  $\text{HNR}^4\text{R}^5$ , wherein  $\text{R}^4$  and  $\text{R}^5$  are independently a  $\text{C}_1\text{-C}_{20}$  alkyl radical which may be at least one of interrupted and substituted by at least one of N and O, wherein N and O may be substituted.

Claim 53 (New): The process as claimed in Claim 20, wherein at least one of the C<sub>1</sub>-C<sub>20</sub> alkyl radicals is at least one of interrupted and substituted by at least one of N and O which is substituted with at least one selected from the group consisting of H, C<sub>1</sub>-C<sub>6</sub>-alkyl, aryl and hetaryl.

Claim 54 (New): The process as claimed in Claim 20, wherein the amine is at least one selected from the group consisting of dimethylamine, diethylamine, methylethylamine, di-n-propylamine, diisopropylamine, diisobutylamine, di-sec-butylamine, di-tert-butylamine, dipentylamine, dihexylamine, dicyclopentylamine, dicyclohexylamine, and diphenylamine.

Claim 55 (New): The additive concentrate as claimed in Claim 12, wherein the polyisobutene of the Mannich adduct has a number average molecular weight of from 500 to 1500.

Claim 56 (New): The additive concentrate as claimed in Claim 12, wherein the phenol of the Mannich adduct is at least one of an unsubstituted phenol and an alkyl substituted phenol.

Claim 57 (New): The additive concentrate as claimed in Claim 12, wherein the phenol of the Mannich adduct is 2-methyl phenol.

Claim 58 (New): The additive concentrate as claimed in Claim 12, wherein the amine of the Mannich adduct is a secondary amine of formula HNR<sup>4</sup>R<sup>5</sup>, wherein R<sup>4</sup> and R<sup>5</sup> are substituents other than hydrogen.

Claim 59 (New): The additive concentrate as claimed in Claim 12, wherein the amine of the Mannich adduct is a secondary amine of formula  $\text{HNR}^4\text{R}^5$ , wherein  $\text{R}^4$  and  $\text{R}^5$  are independently a  $\text{C}_1\text{-C}_{20}$  alkyl radical which may be at least one of interrupted and substituted by at least one of N and O, wherein N and O may be substituted.

Claim 60 (New): The additive concentrate as claimed in Claim 59, wherein at least one of the  $\text{C}_1\text{-C}_{20}$  alkyl radicals is at least one of interrupted and substituted by at least one of N and O which is substituted with at least one selected from the group consisting of H,  $\text{C}_1\text{-C}_6$ -alkyl, an aryl group and a hetaryl group.

Claim 61 (New): The additive concentrate as claimed in Claim 12, wherein the amine of the Mannich adduct is at least one selected from the group consisting of dimethylamine, diethylamine, methylethylamine, di-n-propylamine, diisopropylamine, diisobutylamine, di-sec-butylamine, di-tert-butylamine, dipentylamine, dihexylamine, dicyclopentylamine, dicyclohexylamine, and diphenylamine.

Claim 62 (New): The fuel composition as claimed in Claim 13, wherein the polyisobutene of the adduct has a number average molecular weight of from 500 to 1500.

Claim 63 (New): The fuel composition as claimed in Claim 13, wherein the phenol of the adduct is at least one of an unsubstituted phenol and an alkyl substituted phenol.

Claim 64 (New): The fuel composition as claimed in Claim 13, wherein the phenol of the adduct is 2-methyl phenol.

Claim 65 (New): The fuel composition as claimed in Claim 13, wherein the amine of the adduct is a secondary amine of formula  $\text{HNR}^4\text{R}^5$ , wherein  $\text{R}^4$  and  $\text{R}^5$  are substituents other than hydrogen.

Claim 66 (New): The fuel composition as claimed in Claim 13, wherein the amine of the adduct is a secondary amine of formula  $\text{HNR}^4\text{R}^5$ , wherein  $\text{R}^4$  and  $\text{R}^5$  are independently a  $\text{C}_1\text{-C}_{20}$  alkyl radical which may be at least one of interrupted and substituted by at least one of N and O, wherein N and O may be substituted.

Claim 67 (New): The fuel composition as claimed in Claim 66, wherein at least one of the  $\text{C}_1\text{-C}_{20}$  alkyl radicals is at least one of interrupted and substituted by at least one of N and O which is substituted with at least one selected from the group consisting of H,  $\text{C}_1\text{-C}_6$ -alkyl, an aryl group and a hetaryl group.

Claim 68 (New): The fuel composition as claimed in Claim 13, wherein the amine of the adduct is at least one selected from the group consisting of dimethylamine, diethylamine, methylethylamine, di-n-propylamine, diisopropylamine, diisobutylamine, di-sec-butylamine, di-tert-butylamine, dipentylamine, dihexylamine, dicyclopentylamine, dicyclohexylamine, and diphenylamine.

Claim 69 (New): The lubricant composition as claimed in Claim 14, wherein the polyisobutene of the adduct has a number average molecular weight of from 500 to 1500.

Claim 70 (New): The lubricant composition as claimed in Claim 14, wherein the phenol of the adduct is at least one of an unsubstituted phenol and an alkyl substituted phenol.

Claim 71 (New): The lubricant composition as claimed in Claim 14, wherein the phenol of the adduct is 2-methyl phenol.

Claim 72 (New): The lubricant composition as claimed in Claim 14, wherein the amine of the adduct is a secondary amine of formula  $\text{HNR}^4\text{R}^5$ , wherein  $\text{R}^4$  and  $\text{R}^5$  are substituents other than hydrogen.

Claim 73 (New): The lubricant composition as claimed in Claim 14, wherein the amine of the adduct is a secondary amine of formula  $\text{HNR}^4\text{R}^5$ , wherein  $\text{R}^4$  and  $\text{R}^5$  are independently a  $\text{C}_1\text{-C}_{20}$  alkyl radical which may be at least one of interrupted and substituted by at least one of N and O, wherein N and O may be substituted.

Claim 74 (New): The lubricant composition as claimed in Claim 73, wherein at least one of the  $\text{C}_1\text{-C}_{20}$  alkyl radicals is at least one of interrupted and substituted by at least one of N and O which is substituted with at least one selected from the group consisting of H,  $\text{C}_1\text{-C}_6$ -alkyl, an aryl group and a hetaryl group.

Claim 75 (New): The lubricant composition as claimed in Claim 14, wherein the amine of the adduct is at least one selected from the group consisting of dimethylamine, diethylamine, methylethylamine, di-n-propylamine, diisopropylamine, diisobutylamine, di-

sec-butylamine, di-tert-butylamine, dipentylamine, dihexylamine, dicyclopentylamine, dicyclohexylamine, and diphenylamine.

BASIS FOR THE AMENDMENT

Claims 1, 4-5, 7-10, 12-14 and 16-75 are active in the present application. Claims 2-3, 6, 11 and 15 are canceled claims. Claims 34-75 are new claims. Support for new Claims 34, 41, 48, 55, 62 and 69 is found on page 4, lines 21-22. Support for new Claims 35-36, 42-43, 49-50, 63-64, and 70-71 is found on page 5, lines 14-17. Support for new Claims 37, 44, 51, 65, and 72 is found on page 8, lines 7-9. Support for new Claims 38-39, 45-46, 52-53, 66-67, and 73-74 is found on page 9, lines 4-9. Support for new Claims 40, 47, 54, 68 and 75 is found on page 9, lines 40-45.

No new matter is added.